



**CALIFORNIA  
HIGH-SPEED RAIL  
AUTHORITY**

**BRIEFING: JANUARY BOARD MEETING ITEM # 4**

**TO: Chairman Umberg and Authority Board Members**

**FROM: Roelof van Ark, CEO**

**DATE: January 4, 2012**

**RE: Central Valley – Los Angeles Basin Mountain Crossing (I-5 Grapevine alignment)**

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**Discussion**

Over the past several years, project-level studies have led to an increase in estimated capital cost between Palmdale and Sylmar and recognition of impacts on existing residential and planned developments. These factors led the Authority (at the May 5, 2011 board meeting) to direct staff to conduct a Conceptual Study (Study) of the I-5 corridor to confirm the decision to advance the Antelope Valley corridor route made with the Statewide 2005 Program Environmental Impact Report/Environmental Impact Statement (2005 Program EIR/EIS). Specifically, this Study assessed potential alternatives along the I-5 to determine if new conditions and factors exist that would justify reconsidering the 2005 Program EIR/EIS decision to drop the I-5 corridor in favor of the Antelope Valley corridor. Results of the Study (see attached report) confirm the 2005 decision.

With the 2005 Program EIR/EIS, the Authority and Federal Railroad Administration (FRA) evaluated two corridors between Bakersfield and Sylmar, one along the I-5 and another through the Antelope Valley. The Antelope Valley corridor was selected in the 2005 Program EIR/EIS to be carried forward because it would have fewer potential environmental impacts, it would be less subject to seismic activity, it would have considerably less tunneling and thereby have fewer constructability issues, and it would increase connectivity and accessibility. The Antelope Valley alignment was also found to offer greater opportunities for alignment variations through the mountains to avoid impacts to environmental resources, have less growth inducing impacts on urbanized land and farmland conversion, would provide service to the fastest growing area of Los Angeles County, and had strong support in Los Angeles County.

The 2005 Program EIR/EIS noted comments from the US Environmental Protection Agency and the US Army Corps of Engineers stating concerns regarding potential impacts to the Santa Clara River through the Soledad Canyon portion of the Antelope Valley alignment.

The Authority and FRA also committed to study and consider an option that closely follows State Route 14 (SR 14) through Soledad Canyon as an avoidance option for potential impacts to the Santa Clara River. As a result of project-level study, the current Antelope Valley alignments now diverge from the Santa Clara River and follow SR 14 more closely, thus reducing environmental impacts but with the consequence of increasing tunnel length, construction risk and cost.

The Study revisited the analysis from the 2005 Program EIR/EIS and involved additional engineering design sufficient to identify potential alignments generally following the I-5 that meet minimum engineering criteria. The Study updates the engineering and environmental impact analysis, made in the 2005 Program EIR/EIS, using the current preliminary engineering for the Antelope Valley alignments and new conceptual engineering of the I-5 alignments.

A number of alignments were identified that meet the engineering criteria and avoid crossing wilderness and roadless areas, and that, due to topography, cross other environmentally sensitive areas predominantly in tunnel. However, all these feasible alignments cross existing and planned development, and at this conceptual level of design the costs of mitigating these impacts are difficult to quantify. To clearly compare with the current Antelope Valley alignments, a representative “most viable” I-5 alignment was used. For purposes of comparing the estimated capital costs, allowances for environmental mitigation, impact avoidance and contingency to reflect the differing levels of design development have been included.

The conclusion in the 2005 Program EIR/EIS that the Antelope Valley corridor would have fewer potential environmental impacts than an I-5 alignment is confirmed by this Study, though the difference is less than it was in 2005. The following summary points describe environmental attributes where the I-5 and Antelope Valley alignments are now comparatively better, worse or the same as they were in the 2005 Program EIR/EIS.

- *Cultural Resources* – The 2005 Program EIR/EIS concluded that the Antelope Valley corridor would have greater potential impacts on cultural and paleontological resources. This has been confirmed in the current Study.
- *Biological Resources* – The 2005 Program EIR/EIS concluded that the Antelope Valley corridor would have slightly more potential impacts on biological resources than the I-5 corridor. This analysis was updated by identifying species and habitat within 1,000 feet of the above-ground alignments during the Study and showed that the I-5 alignments impact slightly more species, including the California Condor. Current Antelope Valley alignments have less potential impacts on biological resources than at the program-level, due in part to the current SR 14 alignment avoiding the Santa Clara River in Soledad Canyon between Palmdale and Sylmar. The Antelope Valley alignments therefore now have less potential to impact biological resources than an I-5 alignment.
- *Wetlands and Water Bodies* – The 2005 Program EIR/EIS concluded that the Antelope Valley corridor would have less potential for water-related impacts. Some of the current Antelope Valley alignments have an impact on Lake Palmdale and Una Lake and tunnel under the California Aqueduct. The Study I-5 alignments do not impact any lakes directly, but cross tributaries feeding Pyramid Lake and a large floodplain south of Bakersfield. The Study found the impacts from both I-5 and Antelope Valley alignments are now similar.

- *Growth Inducing Impacts* – In the 2005 Program EIR/EIS, it was concluded that the I-5 corridor would likely indirectly induce population growth around the potential station in Bakersfield. Consequently, farmland conversion in the Central Valley would likely occur. While the Antelope Valley corridor would likely indirectly induce population growth in the Mohave Desert areas closest to the proposed Palmdale station, it would induce less growth than an I-5 alignment. The Study does not change these conclusions.
- *National Forests* – In the 2005 Program EIR/EIS, the most significant difference in potential environmental impacts was in regard to impacts to National Forests. The Antelope Valley corridor was not expected to go through National Forest. The I-5 Study alignment crosses Angeles and Los Padres National Forest for 14 miles. It also passes in tunnel under Wind Wolves Preserve for four miles. The current Antelope Valley alignments still avoid National Forest, so the Study confirms the conclusion of the 2005 Program EIR/EIS.
- *Farmland* – The 2005 Program EIR/EIS concluded that the Antelope Valley corridor would have less potential impacts on prime farmland, but greater impacts on grazing land. This has been confirmed in the current Study.
- *Opportunities For Using Alignment Variations To Avoid Sensitive Resources* – The 2005 Program EIR/EIS concluded that the Antelope Valley corridor offered greater opportunities for high-speed train alignment variations, particularly through the mountainous areas of the corridor, to avoid impacts to environmental resources. In contrast, the more challenging terrain of the I-5 corridor greatly limits the ability to avoid sensitive resources and seismic constraints. This has been confirmed in the Study.

The I-5 and Antelope Valley alignments were also compared with respect to meeting Project objectives, and the Study re-evaluated factors relating to constructability and cost that were considered in the 2005 Program EIR/EIS.

- *Tunnel Length* – In the 2005 Program EIR/EIS, the Antelope Valley corridor had 13 miles of tunnel while the I-5 corridor had 33 miles. After project-level preliminary engineering the Antelope Valley alignments now have 29 miles of tunnel and the conceptual engineering developed in the Study for the I-5 corridor has 31 miles. The length of tunnel is now comparable for both corridors.
- *Capital Cost* – In the 2005 Program EIR/EIS, the cost for the I-5 corridor was estimated at \$6.58B, while the cost of the Antelope Valley corridor was estimated at \$6.46B. During preliminary engineering, the relative cost of the Antelope Valley alignments has increased in part to avoid and reduce impacts. The Draft 2012 Business Plan cost estimate for the Antelope Valley alignment (between Bakersfield and Sylmar) is between \$15.0 billion and \$15.5 billion. A risk adjusted capital cost estimate for the I-5 alignment allows for mitigation, avoidance and contingency amounts, and reflects the differing levels of design development between the I-5 and Antelope Valley corridors. The risk adjusted cost estimate is \$15.1 billion. Like the 2005 Program EIR/EIS, the Study concludes that the cost of an I-5 alignment would be of a similar magnitude to the Antelope Valley alternatives.
- *Alignment Length and Travel Time* – The 2005 Program EIR/EIS concluded an I-5 alignment would be 33 to 36 miles shorter in length and provide travel time savings

of 10 to 12 minutes compared to an Antelope Valley alignment. The Antelope Valley alignments are now up to five miles shorter than envisaged at the Program stage while the Study I-5 alignments are now longer, diverging from the Antelope valley alignments east of Bakersfield. The Study finds that the I-5 alignment would now only be 23 to 25 miles shorter. The analysis of the current Antelope Valley alignments and the I-5 alignments shows that, because of this additional length, the longer steep gradients and the sharp curves needed in Santa Clarita and Tejon Pass, the travel time saving is on average likely to be only three to five minutes. This is substantially less than the anticipated length and travel time advantage in 2005 and confirms the decision to drop the I-5 corridor from further consideration.

- *Stations* – The 2005 Program EIR/EIS considered a station in Santa Clarita, but rejected it in favor of a station in Sylmar. The Santa Clarita station location considered did not provide a direct connection to Metrolink. In addition, factors such as low population and potential future ridership, operational reasons related to terrain, right-of-way issues and cost and impacts to potential cultural resources on the Santa Clara River rejected the option of a station in Santa Clarita. The Study did identify one possible station location adjacent to Metrolink, one along the Santa Clara River and one along the I-5. All potential station locations identified in the Study are in developed areas with significant impacts and restricted right-of-way. City of Santa Clarita staff has expressed concerns about the impacts of the I-5 alignment on the city and have not indicated support for a station. Thus, the conclusions of the 2005 Program EIR/EIS are largely unchanged.
- *Seismic* – The 2005 Program EIR/EIS concluded that the I-5 corridor would have considerably higher seismic issues than the Antelope Valley corridor. Project-level studies for the Antelope Valley have resulted in alignments that cross the San Gabriel fault (which has a low probability of rupture and a small predicted movement) in tunnel. However, the I-5 corridor remains more seismically active than the Antelope Valley corridor, paralleling the San Gabriel fault for 20 miles, and passing through the intersection of the Garlock and San Andreas faults. The topography of the Tehachapi Mountains restricts the feasible alignments to the Tejon Pass. This restriction results in a potentially feasible alignments crossing through the intersection of the San Andreas and Garlock faults. The Study has confirmed that the seismic risk for the I-5 alignment is still greater than for the Antelope Valley alignments.
- *Constructability* – In the 2005 Program EIR/EIS, there were concerns about constructability of an I-5 alignment, particularly relating overall amount of tunneling and to the length of individual tunnels. With the increased amount of tunneling now found necessary on the Antelope Valley alignments, constructability for the I-5 corridor is now comparable with the Antelope Valley.
- *Connectivity into the Antelope Valley* – By definition the Antelope Valley alignment will provide greater connectivity into the Antelope Valley. In the 2005 Program EIR/EIS it was noted that this was the fastest growing area in Los Angeles County, and that the high-speed train system would also provide connectivity to Palmdale Airport and Metrolink commuter rail service. While the economic recession has slowed growth, the Antelope Valley continues to be one of the fastest growing areas in Los Angeles County. Since 2005, additional factors that favor the Antelope Valley alignment include the proposed Desert Xpress rail service between Victorville and

Las Vegas, which recently received environmental approval and the planned High Desert Corridor that will significantly improve connectivity between Victorville and Palmdale. The Study confirms the greater connectivity potential of the Antelope Valley alignments.

The Study also evaluated operational aspects, including ridership, operating costs and maintenance costs that were not compared qualitatively in the 2005 Program EIR/EIS. The Study's ridership analysis has shown that the loss of Antelope Valley commuters for an I-5 alignment reduces the anticipated number of riders by approximately two million annually (5%) and ridership revenue by about \$50 million per year (2%). The shorter I-5 route length is expected to reduce operations and maintenance costs, also by about \$50 million per year. As a result, the net cash flow for the I-5 and the Antelope Valley alternatives would be similar.

During outreach on this Study, most of the stakeholders consulted expressed a preference for the Antelope Valley alignments in order to meet the community needs of the residents in Palmdale and Lancaster. Local residents, businesses, elected officials and regional organizations have emphasized the importance of the high-speed rail system serving the Antelope Valley. Stakeholders that have confirmed their support for the Antelope Valley alignment and urged that the I-5 alignment not be considered further include Los Angeles and Kern counties, the cities of Arvin, Tehachapi, Lancaster and Palmdale, and the community of Rosamond. The Tejon Ranch Company oppose the I-5 alignment. The Center for Biological Diversity oppose the I-5 alignment due to the potential impacts on the Wind Wolves preserve. There has been very little support for an I-5 alignment by stakeholders in the Antelope Valley and Santa Clarita. The City of Santa Clarita has concerns that the potential impacts of an I-5 alignment on the city would be much greater than the impacts from an alignment via Palmdale, although they recognize the opportunity that the I-5 alignment provides for a possible station location in Santa Clarita and the benefits this would bring.

Overall, most of the factors that led the Authority and FRA to select the Antelope Valley corridor in the 2005 Program EIR/EIS to be carried forward are not substantially changed. The Study confirms that the Antelope Valley alignments have fewer potential environmental impacts, enhanced by the selection of alignments more closely following SR 14 and avoiding the Santa Clara River. The advantage of the Antelope Valley alignments with regard to seismic risk is similar, but the advantage on the amount of tunneling and constructability issues are much reduced and the I-5 alternative could be somewhat less costly. The Antelope Valley alignments still offer greater connectivity and accessibility. The Antelope Valley alignments also have greater opportunities for alignment variations through the mountains to avoid impacts to environmental resources reducing risk, have less growth inducing impacts on urbanized land and farmland conversion, would provide service to the fastest growing area of Los Angeles County, and have strong stakeholder support. Taken together these findings reinforce the Authority and FRA decision of the 2005 Program EIR/EIS selecting the Antelope Valley alignment for further study.

### **Staff Recommendation**

Staff requests the Board take action on January 12, 2012 to concur with:

- The Conceptual Study (Study) of the I-5 corridor confirms the decision to advance the Antelope Valley corridor route made with the Statewide 2005 Program Environmental Impact Report/Environmental Impact Statement (2005 Program EIR/EIS).
- The Conceptual Study assessed potential alternatives along the I-5 and determined that new conditions and factors verify the 2005 Program EIR/EIS decision to drop the I-5 corridor in favor of the Antelope Valley corridor.

If the board believes it needs more time, input, or information before making this decision, it can defer action to a future board meeting.

**Attachments**

- ✓ Conceptual Study I-5 Potential Alignment Alternative Bakersfield to San Fernando Valley (Sylmar)
- ✓ CHSRA Resolution # CHSRA 12-01